

What Is Claimed Is:

1. A method for manufacturing a pressed part from a soft magnetic composite material, the method comprising:
 - providing a starting mixture including an iron powder and an auxiliary pressing agent;
 - pressing the starting mixture to form a pressed part; and
 - annealing the pressed part in a gas mixture of inert gas and oxygen, a concentration of oxygen in the gas mixture being between 1% and 10% by volume.
2. The method of claim 1, wherein the concentration of the oxygen in the gas mixture is between 2% and 7% by volume, and the gas mixture is a mixture of air and one of nitrogen and a noble gas.
3. The method of claim 1, wherein the annealing is performed at temperatures between 380°C and 450°C over a time period of 10 to 120 minutes.
4. The method of claim 3, wherein the annealing is performed at a temperature of 425°C over a time period of 30 to 60 minutes.
5. The method of claim 1, wherein the pressing is performed at room temperature, and at a pressure between 600 MPa and 900 MPa.
6. The method of claim 5, wherein the pressing is performed at a pressure between 700 MPa to 800 MPa.
7. The method of claim 1, wherein the iron powder of the starting mixture is a phosphatized, pure iron powder and the auxiliary pressing agent is selected from the group including metal stearates, waxes, paraffins, natural or synthetic fat

derivatives, and oligoamides, the oligoamides including Kenolube®.

8. The method of claim 1, further comprising:

initially annealing the pressed parts at a temperature of 150°C to 400°C in one of air, an inert-gas atmosphere, and a mixture of an inert gas and oxygen in which an oxygen concentration in the gas mixture is between 1% and 10% by volume; and

postforming the pressed parts.

9. The method of claim 8, wherein the pressed parts are initially annealed at a temperature of 230°C to 310°C.

10. The method of claim 8, wherein the postforming includes one of pressing at a pressure between 600 MPa and 900 MPa and planar hot-forming.

11. The method of claim 10, wherein the pressing is performed at a pressure of between 700 MPa and 800 MPa.

12. The method of claim 1, further comprising:

after annealing the pressed part in a gas mixture of inert gas and oxygen, mechanically processing at least sections of a surface of the pressed parts.

13. The method of claim 12, wherein the mechanical processing includes grinding.

14. A method for manufacturing a pressed part from a soft magnetic composite material, the method comprising:

providing a starting mixture including an iron powder and an auxiliary pressing agent;

pressing the starting mixture to form a pressed part;

annealing the pressed part;

after the annealing, postforming the pressed part; and
after the postforming, re-annealing the pressed part.

15. The method of claim 14, wherein the postforming includes one of pressing at a pressure between 600 MPa and 900 MPa at room temperature and flat hot-forming.

16. The method of claim 15, wherein the pressing is performed at a pressure between 700 MPa and 800 MPa.

17. The method of claim 14, wherein the re-annealing is performed at temperatures between 380°C and 450°C over a time period of between 10 and 120 minutes.

18. The method of claim 17, wherein the re-annealing is performed at a temperature of 425°C over a time period of between 30 min and 60 minutes.

19. The method of claim 14, wherein the annealing is performed at a temperature of between 150°C to 400°C over a time period of between 10 min and 120 minutes.

20. The method of claim 19, wherein the annealing is performed at a temperature of between 230°C to 310°C over a time period of between 30 minutes to 60 minutes.

21. The method of claim 14, wherein the pressing is performed at room temperature at a pressure between 600 MPa and 900 MPa.

22. The method of claim 21, wherein the pressing is performed at a pressure between 700 MPa to 800 MPa.

23. The method of claim 14, wherein at least one of the annealing and the re-annealing is performed in one of air, a nitrogen atmosphere, a noble-gas atmosphere, and a mixture of

an inert gas and oxygen having an oxygen concentration of between 1% and 10% by volume.

24. The method of claim 23, wherein the annealing and the re-annealing are performed in a gas mixture of an inert gas and oxygen, the oxygen concentration in the gas mixture being between 1% and 10% by volume.

25. The method of claim 14, wherein the iron powder in the starting mixture is a phosphatized, pure iron powder and the auxiliary pressing agent is selected from the group including metal stearates, waxes, paraffins, natural or synthetic fat derivatives, and oligoamides, the oligoamides including Kenolube®.

26. The method of claim 14, further comprising:
after re-annealing, mechanically processing at least sections of a surface of the pressed parts.

27. The method of claim 26, wherein the mechanical processing includes grinding.